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Docket No.: 13156-00052-US  
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:  
Gerhard Olbert et al.

Application No.: 10/581,986

Confirmation No.: 8992

Filed: June 7, 2006

Art Unit: 1754

For: METHOD FOR PRODUCING  
FORMALDEHYDE

Examiner: Not Yet Assigned

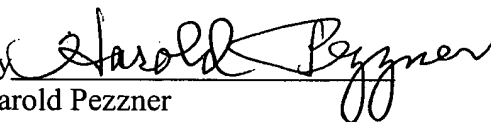
**NOTICE**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In accordance with applicants' duty to disclose attached is a copy of the International Preliminary Report on Patentability of the PCT counterpart for the above case. It is noted that all of the documents cited have already been made of record in an Information Disclosure Statement in this application.

Respectfully submitted,

By   
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From the INTERNATIONAL BUREAU

**PCT**

NOTIFICATION OF TRANSMITTAL  
OF COPIES OF TRANSLATION  
OF THE INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY  
(CHAPTER I OR CHAPTER II  
OF THE PATENT COOPERATION TREATY)  
(PCT Rules 44bis.3(c) and 72.2)

To:

HUHN, Michael  
Isenbruck Bösl Hörschler Wichmann Huhn  
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ALLEMAGNE

B 1	
B 2	
B 3	
Sekr	
EDV	
Abg.	

Date of mailing (day/month/year)	Isenbruck Bösl Hörschler Wichmann Huhn, Patentanwälte Theodor-Heuss-Anlage 12 D-68165 Mannheim
11 January 2007 (11.01.2007)	
Applicant's or agent's file reference	24. Jan. 2007 ✓
B03/0871PC	
International application No.	Frist:
PCT/EP2004/014672	Vorfrist:
Applicant	WV:
	BASF AKTIENGESELLSCHAFT et al

**IMPORTANT NOTIFICATION**

International filing date (day/month/year)  
23 December 2004 (23.12.2004)

**1. Transmittal of the translation to the applicant.**☐

The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).

☒

The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

**2. Transmittal of the copy of the translation to the designated or elected Offices.**

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

KR

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EA, EC, EE, EG, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

**3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).**

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO  
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1211 Geneva 20, Switzerland

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**TRANSLATION****PATENT COOPERATION TREATY****PCT****INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>B03/0871PC</b>	<b>FOR FURTHER ACTION</b>	See Form PCT/IPEA/416
International application No. <b>PCT/EP2004/014672</b>	International filing date (day/month/year) <b>23.12.2004</b>	Priority date (day/month/year) <b>23.12.2003</b>
International Patent Classification (IPC) or national classification and IPC <b>B01J8/02</b>		
Applicant <b>BASF AKTIENGESELLSCHAFT</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising: a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows: <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input checked="" type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/014672

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_ which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-14 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 1-18 \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- sheets 1-10 \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
- ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/014672

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-18</u>	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	<u>1-18</u>	NO
Industrial applicability (IA)	Claims	<u>1-18</u>	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

## 1. Reference is made to the following documents:

D1: WO 02/068110 A (METHANOL CASALE S.A; FILIPPI, ERMANNO; RIZZI, ENRICO; TAROZZO, MIRCO),  
6 September 2002 (2002-09-06)

D2: DE 10 031 347 A1 (BASF AG), 4 January 2001  
(2001-01-04)

D3: EP-A-1 153 653 (METHANOL CASALE S.A),  
14 November 2001 (2001-11-14)

D4: US-A-3 420 783 (STEN-AKE BERGSTRAND),  
7 January 1969 (1969-01-07)

## 2. The application fails to meet the requirement of PCT Article 33(3).

2.1 Closest prior art

Document D1, which is considered to be the closest prior art, discloses a process for producing **formaldehyde** using a catalytic fixed bed and a **plate heat exchanger** (see D1, International Search Report).

2.2 Novelty

The subject matter of claim 1 differs from that of D1

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

in that (1) the catalyst contains **iron** and **molybdenum**.

D1 provides no details relating to the composition of the catalyst. The subject matter of claim 1 also differs from that of D1 in that (2) formaldehyde is produced by **gas phase oxidation** of methanol vapour with oxygen. D1 also provides no details relating to the exact way in which the formaldehyde is produced.

### 2.3 Inventive step

The applicant is advised that (1) iron-molybdenum catalysts are already known in connection with the production of formaldehyde by gas phase oxidation of methanol vapour with oxygen (see D4, International Search Report). Also, with regard to (2), documents D1, D2 and D3 describe catalytic fixed beds with **plate heat exchangers** (see D2 and D3, International Search Report). These devices are used for **exothermic reactions**, for example to avoid the disadvantages of tubular reactors (hot spots), and can guarantee isothermic reaction conditions. The use of **plate heat exchangers** is generally known for exothermic reactions. A person skilled in the art wishing to avoid the disadvantages of tubular reactors (see the present application, page 3, lines 10 to 40) would therefore use **plate heat exchangers**.

The applicant is further advised that although the drawings in D1 show only a single plate, it is clear to a person skilled in the art that there is a **plurality** of parallel plates (see D1, page 1, lines 17 to 21). The term "**plate exchangers**" on page 1 of D1 (line 19) refers of course not to a single plate but

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/014672

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

to a plurality of plates distributed within the catalytic bed, which prevent the formation of hot spots and allow better temperature control.

The applicant is also advised that claim 1 does not exclude plate heat exchangers with **two** heat exchange mediums (claim 1: "through which a heat exchange medium flows" does not mean that there must be **only** one heat exchange medium).

An inventive step cannot therefore be acknowledged (PCT Article 33(3)).

- 2.4 Claims 2 to 18 do not contain any features that meet the PCT requirements in respect of inventive step. The features specified in these claims either are known from documents D1 to D4 or are standard features.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/014672

## Box No. VI Certain documents cited

## 1. Certain published documents (Rule 70.10)

Application No. Patent No.	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
EP-A-1 477 220	17.11.2004	16.05.2003	

## 2. Non-written disclosures (Rule 70.9)

Kind of non-written disclosure	Date of non-written disclosure (day/month/year)	Date of written disclosure referring to non-written disclosure (day/month/year)
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